

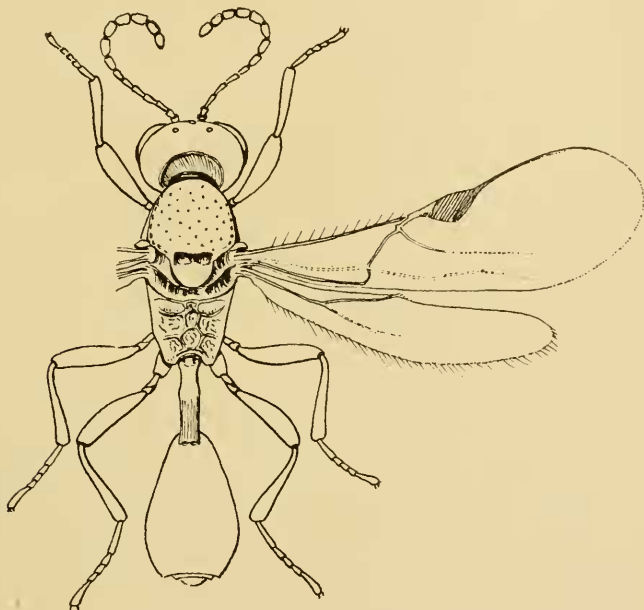
brownish yellow, the hind femora and tibiae, sometimes also the hind coxae and the anterior and middle femora, more or less infuscated.

Male.—Like the female except for its slightly wider face, longer malar space and more slender antennae.

Type.—United States National Museum No. 62982.

Type locality.—Mt. Carmel, Connecticut.

Described from 34 females and 10 males reared by Kathryn M. Sommerman from nymphs of the psocid *Anomopsocus amabilis* (Walsh).



Drawn by Arthur D. Cushman

Fig. 1: *Euphoriella sommermanae*, new species, female.

PARASITIZATION OF NYMPHAL AND ADULT PSOCIDS (PSOCOPTERA)

By KATHRYN M. SOMMERMAN, *U. S. Public Health Service, Anchorage, Alaska.*

Occasionally I have collected parasitized psocids, but until recently my attempts to rear the parasites to the adult stage, for identification, have been unsuccessful. Adults of a braconid, described earlier in this number of the *Proceedings* (p. 148) by C. F. W. Muesebeck as *Euphoriella sommermanae*, have been reared from *Anomopsocus amabilis* (Walsh); and some parasitic larvae, emerging from nymphs

of *Mesopsocus laticeps* (Kolbe) and *Teliapsocus conterminus* (Walsh), have spun cocoons from which adults may emerge eventually.

With the aid of a hand lens a parasitized psocid nymph or adult may be easily recognized, especially when the parasitic larva is nearly mature. The abdomen of the psocid is usually glossy and distended; in the case of the nymphs it is distended to a size normal for a last or fifth instar although the wing pads indicate the individuals to be an instar or two younger. In addition, the coil of the gut is often pushed over to one side or the abdomen is definitely asymmetrical. Sometimes the mature parasite larvae extends into the thorax.

It is difficult to estimate the percentage of a psocid population that is parasitized, because the non-parasitized nymphs tend to complete their development slightly earlier, and the adults could fly away leaving a nymphal population with a high percentage parasitized. Also, the psocid nymphs die within a day or two after the parasites emerge from them. Observations made during June and July, 1955, indicate that parasitization may be extremely localized. The population of *T. conterminus* in one brush pile was parasitized while a less densely populated brush pile about 500 feet away apparently contained no parasitized psocids. The same was true of populations of *A. amabilis* in three brush piles ten to thirty feet apart; only the psocids in the most densely populated pile were parasitized.

The collecting and rearing equipment and procedure are simple and rather satisfactory. The metal caps and rubber plugs were removed from dental tubes, the tubes washed, and a small amount of cotton tamped inside up by the neck of each. A cork was inserted in the larger opening at the opposite end. When psocids are being collected the cork is removed and the neck of the dental tube inserted in a piece of rubber tubing. The psocid is sucked into the dental tube, the cork replaced and the occupied tubes put in a plastic box containing a piece of moist paper. Later a piece of leaf or bark is slipped into the tube to serve a food for the psocid, moist cotton plugs are substituted for the corks and the tubes are placed upright in racks. When a psocid becomes sluggish, indicating that the parasite is about ready to emerge, a few tiny pieces of crushed dried leaf or a little fine sand are inserted for debris.

Collection data for the parasitized psocid nymphs (fourth, fifth and sixth instars) and adults that have come to my attention follow. In all cases the parasitic larvae were Hymenoptera and probably all were Braconidae.

CAECILIIDAE

Caecilius, n. sp. (description by Mockford in press): 3 nymphs, Apple River Canyon State Park, Ill., Aug. 25, 1949. *Teliapsocus conterminus* (Walsh): 7 nymphs, Mt. Carmel, Conn., July 20, 1955; 7 nymphs, same locality but July 21 (these parasitic larvae emerged and spun cocoons).

POLYPSOCIDAE

Polypsocus corruptus (Hagen): 1 nymph, Northeast of Wheaton, Md., June 16, 1950; 1 nymph, Rock Creek Park, Washington, D. C., Oct. 6, 1951, and another Oct. 20, 1951.

LACHESILLIDAE

Lachesilla anna Sommerman: 3 nymphs, Mt. Carmel, Conn., July 20, 1955. *Lachesilla* (?) sp.: 1 nymph (3SA27F, Canadian National Collection.)

PERIPSOCIDAE

Peripsocus madidus (Hagen): 1 nymph, Leveret, Mass., Aug. 19, 1951; 2 nymphs, Army Medical Center, Washington, D. C., Oct. 7, 1951. *P. quadrifasciatus* (Harris): 1 nymph, Urbana, Ill., Aug. 26, 1949; 5 nymphs, Oakwood, Ill., Oct. 2, 1949; 1 nymph, Murphysboro, Ill., Sept. 20, 1949; 1 nymph, Monticello, Ill., Oct. 9, 1949; 1 nymph, Willimantic, Conn., July 22, 1951. *Ectopsocus californicus* (Banks): 1 female, Camp Picket, Va., July 20, 1953; 1 nymph, Dumfries, Va., Aug. 3, 1953. *Anomopsocus amabilis* (Walsh): About 50 nymphs, Mt. Carmel, Conn., June 18 and 19, 1955 (many parasites successfully reared to the adult stage).

MESOPSOCIDAE

Mesopsocus laticeps (Kolbe): 3 nymphs, Mt. Carmel, Conn., June 29 and 30, 1955 (two parasites spun cocoons). *M. unipunctatus* (Mull.): 26 nymphs, Big Meadows Camp Ground, Skyline Drive, Va., June 19, 1952.

PSOCIDAE

Blastopsocus variabilis (Aaron): 1 nymph, Northeast of Wheaton, Md., June 16, 1950; 1 nymph, Army Medical Center, Washington, D. C., Sept. 27, 1952. *Psocus leidyi* Aaron: 1 female, Northeast of Wheaton, Md., June 16, 1950; 1 nymph, Rock Creek Park, Washington, D. C., Sept. 23, 1951. *P. lithinus* Chap.: 2 nymphs, Mt. Carmel, Conn., Aug. 9, 1951; 2 nymphs and 4 females, Mt. Carmel, Conn., Aug. 13, 1951. *P. pollutus* Walsh: 2 females, Antioch, Ill., July 7, 1932; 1 nymph, Englewood, Fla., March 23, 1952. *Psocus* n. sp.: 1 nymph, Northeast of Wheaton, Md., June 16, 1950. *Psocus* sp.: 1 nymph, Englewood Cliffs, N. J., Sept. 19, 1925; 1 nymph, Mt. Carmel, Conn., Sept. 23, 1950. *Trichadnotecnum unum* Somm., 2 nymphs, Mt. Carmel, Conn., June 29, 1955. *Loensia moesta* (Hagen): 2 nymphs, Mt. Carmel, Conn., June 29, 1955. *Amphigerontia bifasciata* (Latr.): 1 nymph, Big Meadows Camp Ground, Skyline Drive, Va., June 19, 1952.

MYOPSOCIDAE

Myopsocus sp.: 2 nymphs, Rock Creek Park, Washington, D. C., June 29, 1952.

The following information was obtained while three larvae of *Euphoriella sommermanae* were observed emerging from three nymphs of *A. amabilis*. The psocid nymphs were sluggish and walked only when disturbed by another psocid or when prodded. About two-and-a-half hours before actual rupture of the abdominal wall by the parasite larva, a patch of the pigmented layer under the integument had already been cleared away at the side of the abdomen in the vicinity of segments 3 to 5. The larva could be seen moving about inside. Spasmodically the head and abdomen of the psocid protruded simultane-

ously as the parasite "scraped" away the tissue. Actual emergence, from the time the abdominal wall was first ruptured until the larva was entirely free of the psocid, required about 5 or 6 minutes, but most of that time was occupied in making the rupture large enough to allow the large end (head?) of the parasite to pass through. As soon as the large end was free the larva popped out. Then it hitched nervously and actively about, small end (tail?) first, for about two hours before starting to spin its cocoon. It required about two hours of spinning before the silk was too dense to permit me to see inside the cocoon. Two of the parasites remained in the cocoon 13 days before emerging and the third died after cutting an emergence opening in the cocoon.

The parasitic larvae that emerged from *T. conterminus* and *M. laticeps* were not timed, but the process of emergence and spinning was the same as for those from *A. amabilis*.

BOOK NOTICE

TAXONOMIC APPRAISAL AND OCCURRENCE OF FLEAS AT THE HASTINGS RESERVATION IN CENTRAL CALIFORNIA, by Linsdale, J. M. and B. S. Davis. Univ. California Publ. Zool., 54(5):293-370, plates 11-22, 27 figs. in text. 1956. Univ. California Press, Berkeley. \$1.50.

This paper discusses host relationships, seasonal distribution and taxonomy of flea species found on the Frances Simes Hastings Natural History Reservation, Monterey County, California. Continuing collection over a 17 year period yielded a total of 27 flea species taken from 34 species of mammals.

Each flea species is dealt with from the standpoint of its distribution by month of the year, host preference and overall male : female ratio. The taxonomic status of several species is changed, and discussions of individual variation within certain of the species is presented. Charts are included which show the seasonal distribution of all species of fleas found on each host.

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